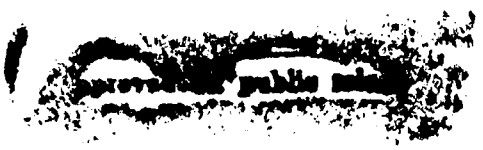
Columbia, Committee on Governmental Affairs. U.S. Senate

ebruary 1990

MILITARY INSTALLATIONS

Coal Inventory and Consumption in the Federal Republic of Germany

2998



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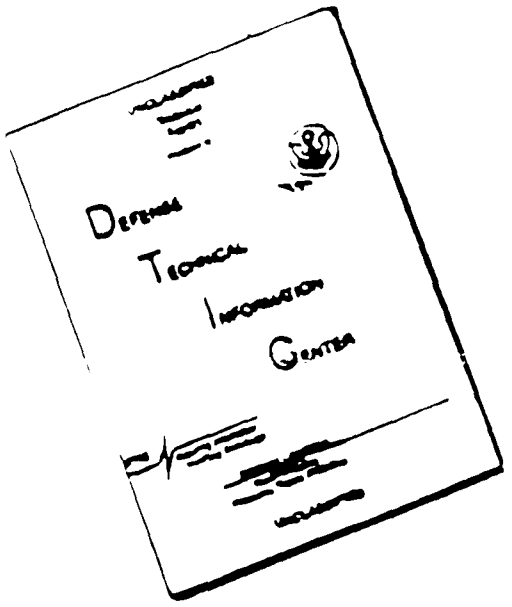

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United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-237391

February 23, 1990

The Honorable John Heinz
Ranking Minority Member
Subcommittee on General Services,
Federalism, and the District of
Columbia
Committee on Governmental Affairs
United States Senate

Dear Senator Heinz:

This report responds to your December 15, 1988, request that we review the use of U.S. bituminous and anthracite coal at Department of Defense (DOD) facilities in the Federal Republic of Germany (Germany). The report provides the results of our efforts to independently verify the accuracy of DOD-reported coal inventory data as of April 1, 1988, September 30, 1988, and December 31, 1988. It also discusses the accuracy of DOD's current and projected coal consumption data for these facilities.

DOD had reported that between April 1, 1988, and December 31, 1988, it had between 306,000 and 419,000 tons of U.S. anthracite and bituminous coal stored in Germany. Roughly two-thirds of that amount was anthracite coal.

Results in Brief

We reviewed six coal-handling locations that accounted for 72 to 79 percent of the total U.S. coal (bituminous and anthracite) between April and December 1988. We verified DOD's reported data for one location—the central coal storage facility at Rheinau, which contains about 60 percent of all U.S. coal stored in Germany.

We could not verify the official inventory records at the other five locations we visited—two Air Force and three Army locations—for the following reasons. The Air Force had not conducted required physical inventories of coal in recent years and special inventories performed for us showed significant inventory-related problems. For example, at one Air Force location the amount of anthracite coal on hand exceeded the totals on the official records by 55 percent. At the other Air Force location, the special inventory did not provide accurate data that could be compared to the official records because the coal piles could not be properly shaped due to a lack of storage space caused by accumulated excess coal.

We did not accept the inventory data at the three Army locations as accurate for two reasons. First, past audits of coal operations addressing inventory practices at Army installations had identified a number of deficiencies that could affect inventory accuracy. Second, because of the cost and time constraints, the Army was unable to conduct special inventories to verify the data.

In responding to our draft report, DOD acknowledged the deficiencies disclosed by past audits, and stated that the Army had instituted corrective actions to improve coal inventory procedures. DOD indicated that the current inventories at these locations are now accurate. However, no follow-up audit had been done to substantiate the extent of any improvements made.

DOD's coal consumption data for fiscal year 1988 appeared to be accurate since it matched the data reported on source documents maintained at the installations and their commands. Coal consumption projections for fiscal years 1989 through 1992 also appeared to be reasonable. They were based on 1988 coal consumption data and they reasonably reflected scheduled dates for converting existing heating systems from coal to other sources of energy.

According to reported DOD coal inventory and consumption data, as of September 30, 1988, DOD had sufficient anthracite coal on hand to satisfy projected demands through at least fiscal year 1993, given that no additional heating plant conversions other than those already approved occur and no additional shipments of coal occur. If planned conversions are added, the on-hand inventory will satisfy demands through fiscal year 1994. These estimates could change, given the potential coal inventory data inaccuracies affecting about 40 percent of the total, the implementation of 27 conversions certified by the Secretary of Defense to be in the best interest of the nation between fiscal years 1992 and 1993, and the uncertainty of actual conversion dates. On the other hand, additional shipments of bituminous coal are needed during fiscal year 1990 and beyond to satisfy projected demands.

According to DOD, as of September 30, 1988, its facilities in Germany had a minimum of a 5-year supply of anthracite coal on hand. It said that these stocks will probably last longer, since only nut-sized anthracite will be consumed by fiscal year 1993. Other sizes of anthracite will last at least until fiscal year 1998, at projected levels of use.

A more detailed discussion of our findings and inventory data can be found in appendixes I through VI. Our objectives, scope, and methodology are described in appendix VII.

gency Comments

DOD generally concurred with GAO's findings (see app. VIII), but suggested several clarifications, which we have incorporated in the report where appropriate.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days from the date of this letter. At that time, we will send copies to the Chairmen, House and Senate Committees on Appropriations and on Armed Services; the Secretaries of Defense, the Army, and the Air Force; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others upon request.

GAO staff members who made major contributions to this report are listed in appendix IX. If you have any questions, please call me on (202) 275-8412.

Sincerely yours,

Donna M. Heivilin
Director, Logistics Issues

Contents

gures

Abbreviations

DOD Department of Defense
GAO General Accounting Office

ppendix I

J.S. Coal Inventory and Consumption in the 'ederal Republic of Germany

After World War II, the U.S. forces in Germany acquired over 10,000 boilers to heat buildings, about 90 percent of which were hand fired by German coal and then later with U.S. anthracite coal. Later the Department of Defense (DOD) began modernizing some older systems with automatic controls and insulation and converting others to more efficient or local heating systems. Some of the older anthracite-fueled boilers have been replaced by boilers fueled with bituminous coal, oil, gas, or energy provided by local utility companies.

Military installations (e.g., shops, barracks, and housing areas) in Germany use two types of coal: anthracite and bituminous. Anthracite is the harder grade of coal and bituminous is a soft coal. Burning bituminous coal is estimated to be as much as 40 percent cheaper than burning anthracite coal.

DOD-wide energy consumption data for heating military installations in Germany were not readily available. However, the Army reported that during fiscal year 1988 coal comprised about 26 percent (anthracite, 12 percent; and bituminous, 14 percent); oil, 38 percent; local utilities, 29 percent; and natural gas, 7 percent, of its actual heating energy consumption.

DOD plans to convert most of the remaining heating systems that burn U.S. coal to other energy sources. However, the conversions are only partially completed because of congressional restrictions dating back to fiscal year 1972. Most recently, the Defense Appropriations Act of fiscal year 1989 did not permit the expenditure of funds to convert DOD facilities from coal to other energy sources until 90 days after a study on the economic consequences of using U.S. coal at DOD installations in Europe was completed.[1] However, the act also permits conversions if the Secretary of Defense certifies in writing that the conversions are in the best interest of the nation. On August 7, 1989, the Secretary certified that 27 conversions met this criteria.

Burning coal has become a sensitive political issue. Both the U.S. and German governments are concerned about the environmental impact associated with burning coal. The coal industry is worried about losing

[1]The study was completed on June 29, 1989.

business, while the Congress is apprehensive about economic and perceived security[a] consequences associated with converting from coal to other energy sources.

pment, tribution, and nagement of Coal

DOD facilities in Germany can obtain coal from any U.S. mine if the coal meets DOD's contract specifications and price guidelines. In recent years, American coal shipped to Germany has come mainly from Pennsylvania, West Virginia, and Kentucky. The Military Sealift Command ships the coal from Norfolk, Virginia, and Philadelphia, Pennsylvania, to Amsterdam or Rotterdam in the Netherlands or Antwerp, Belgium.

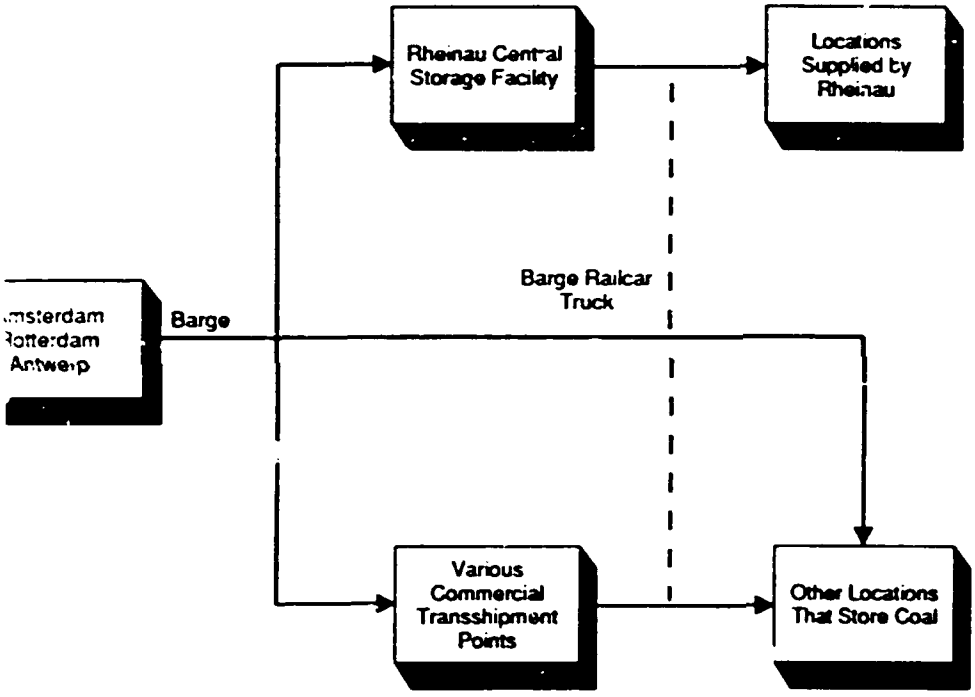
Once the coal arrives, DOD contractors transport the coal by barge, railcar, or truck to defense facilities in Germany. Contractors off-load the coal from ships in European ports and transport it by barge directly to Rheinau. The principal destination is the Fixed Facility Fuels Division at Rheinau (DOD's central coal storage facility in Germany) managed by the 200th Theater Army Materiel Management Center. The Rheinau coal facility distributes the coal by barges, railcars, or trucks to various Army communities and Air Force bases as needed. In 1988, Rheinau shipped 69,598 metric tons of coal—3,818 metric tons by barges; 5,555 metric tons by railcar; and 60,225 metric tons by trucks. For other storage destinations, contractors may transport coal from the European ports directly to the applicable location, or via various commercial transshipment points along the Rhine River. Figure I.1 shows the distribution network of coal in Europe.

Contractors transfer the coal to DOD at the Rheinau central storage facility or other applicable locations, including the commercial transshipment points. Before accepting the coal, military representatives review official documents and inspect and analyze the coal to verify quantity and quality. Coal yard personnel also visually inspect the coal for type and size consistency and for evidence of impurities and pilferage. As an additional check, these officials send some coal samples to laboratories for further analysis.

The U.S. European Command and two of its major commands—U.S. Army, Europe, and U.S. Air Force, Europe—are responsible for overall

[a]Some Members of Congress have argued that relying on heat from local utilities presents a security risk because German fuel suppliers rely in part on the Soviet Union and the Middle East for oil and natural gas supplies.

re I.1: Distribution of Coal in Europe



coal management. However, the European Command has delegated specific management functions to the 200th Theater Army Materiel Management Center, Fixed Facility Fuels Division, Rheinau. The Rheinau facility's management responsibilities include

- receiving, issuing, accounting for, and inventorying coal at Rheinau;
- maintaining a coal reserve for the Army and Air Force in Germany;
- developing policy for coal operations at Army locations in Germany;
- inspecting coal operations and training coal handlers; and
- determining the military's total annual coal requirements in Germany by obtaining and consolidating input from the various Army and Air Force installations that use coal.

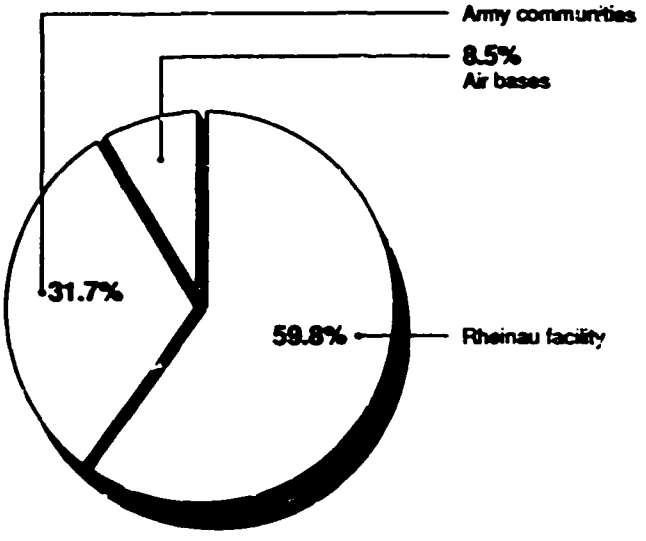
The Army communities and Air Force bases that store coal also receive, issue, account for, and inventory coal at their respective installations. In

addition, all military locations that use coal are responsible for estimating their annual coal requirements and reporting these needs to the Rheinau facility. The Defense Fuel Supply Center awards coal contracts, and the Army Contracting Center, Europe, manages them.

D-Reported Coal Inventory Data

DOD reported that as of April 1, 1988, September 30, 1988, and December 31, 1988, it had between 306,000 and 419,000 tons of coal stored in Germany. Between 63 and 76 percent of the total was anthracite, and the remainder was bituminous coal (see apps. II and III). Most of the U.S. coal stored in Germany was at the Rheinau central storage facility. It stored 56 to 63 percent of DOD's reported coal inventory during this period. Figure I.2 shows the percent of the total coal stored by location as of September 30, 1988. Due to Rheinau's large storage capacity (400,000 metric tons), it maintains a coal reserve for the Army and Air Force in Germany. Additionally, Rheinau routinely supplies coal to military facilities throughout Germany that have limited or no coal storage capacity. Other Army locations in Germany stored between 28 and 35 percent of DOD's reported coal inventories. Air Force bases in Germany stored the remaining 9 percent of the coal.

e I.2: Coal Inventory by Location (As tember 30, 1988)



curacy of Inventory ta

Army guidelines require that coal yard personnel perform physical inventories annually. Guidelines also specify procedures for shaping and measuring coal piles to calculate their volumes accurately. For example, a coal pile might be cone-shaped. By measuring the height and the base of the cone, the volume can be calculated. Under these guidelines, a variance of 10 percent or less in the total amount of coal, by type and size, between a physical inventory's results and the storage site's official inventory records is allowable. The Air Force has similar guidelines.

In September 1988, the 200th Theater Army Materiel Management Center's Internal Review Office evaluated Rheinau's fiscal year 1988 coal inventory valued at about $17 million. The review office could not issue an opinion on the accuracy of the inventory because Rheinau did not follow accepted procedures for conducting inventories. First, most coal stockpiles were not uniformly shaped, making accurate measurement difficult or impossible. Second, stockpiles were not properly measured due partially to the poor condition of the stockpiles. Third, Rheinau did not follow proper inventory count techniques that require two teams to count the stock and a third count to resolve any discrepancies. The Center said that corrective action would be taken by the time Rheinau performed its next scheduled inventory at the end of the fiscal year.

To relieve doubts about the accuracy of the reported coal inventory at Rheinau and to assist our review efforts, the Army decided to perform a special or out-of-cycle physical inventory at Rheinau in May 1989. We observed the special inventory, including the shaping and the measuring of coal piles and the calculations of volumes. We determined that coal yard personnel performed the inventory satisfactorily.

Later in May 1989, Rheinau officials contracted for another inventory—an independent aerial survey to confirm the earlier inventory's accuracy. We compared the resulting measurements with the earlier manual inventory. The results of both inventories differed from Rheinau's official inventory record by less than the allowable 10-percent variance, although some of the individual coal piles showed a larger variance. Using the manual inventory as a baseline, we then reconciled DOD's reported inventory data for the three specified dates with Rheinau's official inventory records.

In responding to our draft report, DOD agreed that the differences between the inventories were within the allowable variance and added that the aerial survey was within 1.4 percent of earlier estimates.

Army Locations

No recent audit of coal operations addressing inventory practices had been conducted at any of the Army bases in Germany, since a 1982 report by the Office of the Auditor General, U.S. Army, Europe. This report identified a number of deficiencies that could affect inventory accuracy.[1] For example, the report noted coal piles were estimated and measurements were adjusted to make quantities agree with stock records; some coal piles were not maintained in shapes that could be accurately measured; and the same personnel who maintained the stock record balances also performed the inventories. The audit concluded that, as a result, stock record balances could not be verified and there was no assurance that losses or diversions of coal had not occurred.

In view of the 1982 audit and similar findings in the previous Rheinau audit, we were unwilling to accept the accuracy of the inventory data at the three Army locations, unless the Army performed special inventories for us to observe. However, the Army did not do this because of (1) the costs involved and (2) insufficient time to award a contract for performing the inventories and provide us with the results prior to completion of our work. Instead, coal yard officials gave us inventory results for the previous year and said that the inventories had been performed in accordance with the Army's guidelines.

In response to our draft report, DOD stated that since the 1982 Army Audit Agency report the Army has instituted a number of corrective actions to improve its coal inventory procedures, such as training coal inspectors on how to perform inventories and emphasizing to coal yard supervisors the need to maintain uniformly shaped coal piles. DOD believes that the Army's inventory procedures are now thorough and the reported inventories at the Army locations are accurate.

Air Force Locations

At the two Air Force locations we visited, Bitburg and Spangdahlem, we found that no physical inventories of coal had ever been conducted. As a result, base officials agreed to conduct physical inventories in May 1989 for us to observe.

[1]Audit of Coal Management - U.S. Army, Europe and Seventh Army (Report No. EU-82-203, Mar 1982).

Coal yard personnel performed the inventory satisfactorily. However, for two of the three types of coal stored at Bitburg, the inventory results greatly exceeded the amounts shown on stock record cards. For example, the physical inventory team reported 55 percent more anthracite coal than was recorded on the stock records. The responsible Air Force official could provide no reasons for this or the other wide variance. The official said that Bitburg personnel plan to review their records.

At Spangdahlem the coal yard personnel were unable to accurately measure the coal piles because the piles could not be properly shaped due to excess coal on hand resulting from inadequately matching supplies on hand with user needs. According to base officials, a proper inventory could not be conducted until the "overstocked" situation abates.

To address the inventory accuracy issue, DOD stated that the Air Force will develop an alternative inventory assessment technique by the first quarter of fiscal year 1990. The Air Force will also consider including coal inventory as a material weakness in the next Air Force Federal Managers' Financial Integrity Act report to DOD.

DOD-Reported Coal Consumption Data

As shown in figure I.3, DOD's reported consumption of U.S. coal in Europe decreased 48 percent, from about 505,000 metric tons in fiscal year 1983 to about 262,000 metric tons in fiscal year 1988. Most of this decrease was in anthracite coal consumption, which fell 62 percent. Bituminous coal consumption decreased 26 percent (see app. IV).

DOD cited two major reasons for this reduction. One is the Army's and Air Force's reduction in overall heating energy demand. For example, as part of its energy conservation program, the Army modified buildings and installed heating controls. According to the Army, its heating energy demand decreased 24 percent from fiscal year 1983 to fiscal year 1988. The Air Force reported a 20-percent reduction in its energy consumption during this period.

The Army also converted many of its facilities to other heating energy sources. In fiscal year 1983, the Army used coal and oil to meet 90 percent of its heating energy demand. By fiscal year 1988, the Army used more district heat,[1] the coal and oil use rates declined to 65 percent of total heating energy demand.

[1]District heat is heat energy provided by local German utility companies.

gure I.3: Coal Consumption for Fiscal ars 1983-1988

rojected Consumption

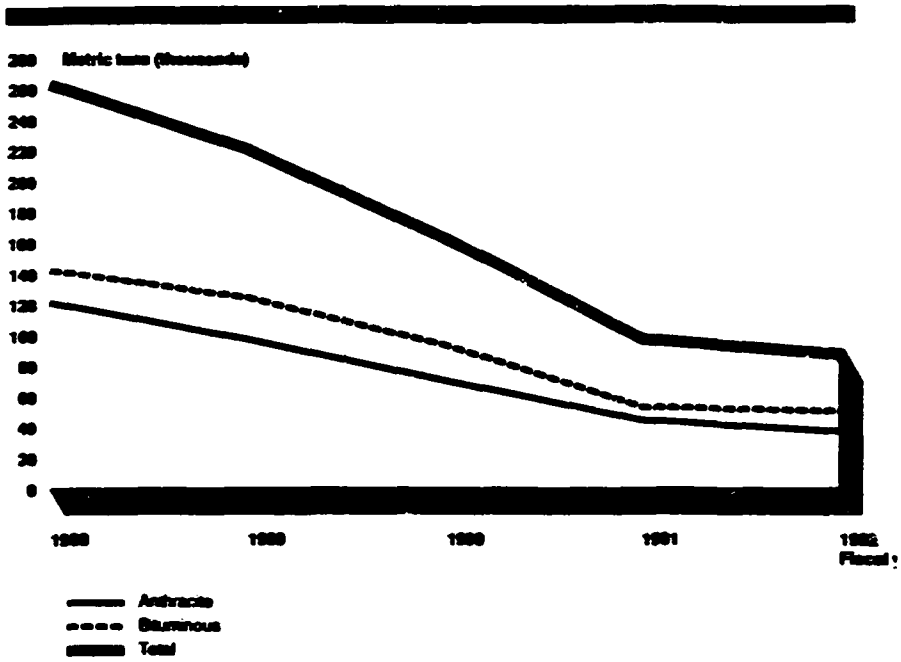
The Army provided us two scenarios regarding its future coal consumption in Germany. One is based on "approved" heating conversions and the other on approved and "planned" conversions to either district heat or gas.[5] Because the Air Force is still developing its heating conversion plans, it reported a constant consumption level of about 71,000 metric tons per year. Consequently, the Army's consumption decrease accounts for the total projected decrease in DOD's consumption from the end of fiscal years 1988 to 1992 (see fig. I.4).

pproved and Planned onversions

At the beginning of fiscal year 1989, the Army had completed or partially completed 86 of 100 signed contracts for converting its heating facilities in Germany to alternative energy sources. During fiscal years 1989 through 1992, the Army plans to complete the other 14 conversions—12 of the conversions are to district heat and 2 are to gas. Under this scenario, the Army projects that between fiscal years 1989 and 1992 its total coal consumption will decrease about 113,000 metric tons.

[5]An "approved" heating conversion is a contract signed by all relevant parties. A "planned" heating conversion is one submitted to the Secretary of the Army for approval.

Figure I.4: Projected Coal Consumption (Approved and Planned)



Of this total decrease, anthracite coal accounts for 42 percent and bituminous coal for 58 percent (see app. V).

In November 1988, the Office of the Deputy Chief of Staff (Engineer), U.S. Army, Europe, submitted 24 additional conversion plans to the Secretary of the Army. In August 1989, the Secretary of the Army notified the Congress of the planned conversions. After all the conversions are completed, the Army estimates that between fiscal years 1989 and 1992, its total coal consumption in Germany will decrease about 133,000 metric tons. Of this total decrease, anthracite coal accounts for about 45 percent and bituminous coal for about 55 percent (see app. VI).

Accuracy of Consumption Data

We could not verify the accuracy of DOD's coal consumption data for fiscal year 1982 because the Air Force data for that time period had not been retained and, therefore, the overall data were incomplete. Also, it was impractical to verify fiscal year 1983 through 1987 coal consumption data because it would involve a review of thousands of coal-fired boiler usage records that would be time-consuming and labor-intensive. However, DOD coal consumption data for fiscal year 1988 appeared to be

accurate because it matched, with minor exceptions, with the data reported on source documents maintained at the facilities and their commands.

We found that the coal consumption projections for fiscal years 1989 through 1992 for the three Army communities appeared to be reasonable. The projections were based on 1988 coal consumption data and they reasonably reflected plans for converting existing heating plants to other energy sources. For example, 71 of 73 approved heating plant conversions in the Army's V and VII Corps were on schedule. Therefore, the coal consumption projections for their 71 approved conversions were accurate. The other two conversions were not on schedule. One conversion had not been completed on time, although this was not reflected in DOD's projection. In the second case, the actual conversion date differed from the date in DOD's projection by one year.

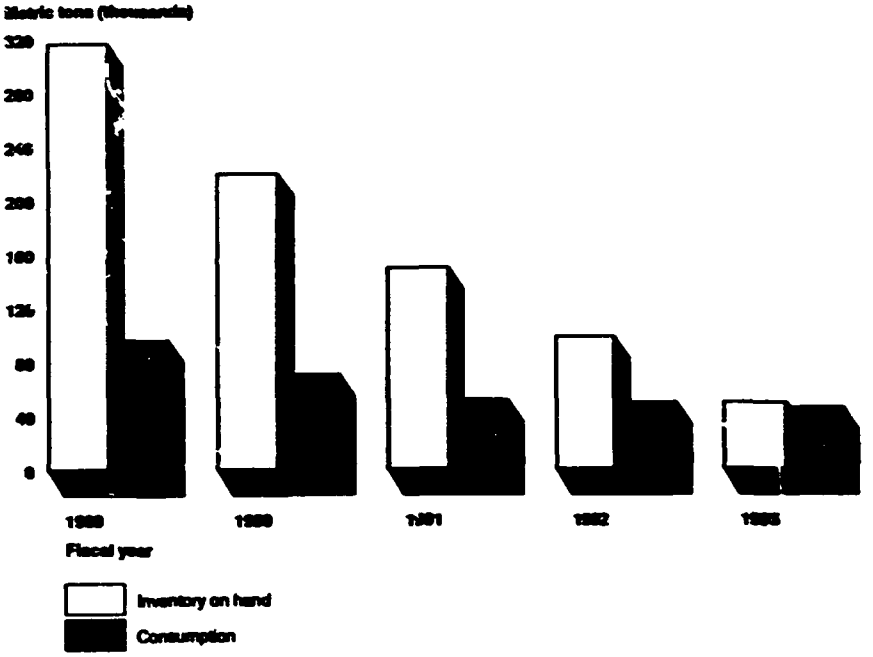
Because the Air Force had not yet finalized its heating conversion plans, it projected that coal consumption would remain constant at about 71,000 metric tons per year during fiscal year 1989 through 1992. According to Air Force officials, however, an ongoing engineering study may recommend a reduction of coal consumption beginning in fiscal year 1992.

Matching Reported DOD Coal Inventories With Projected Coal Consumption

According to DOD, it had about 316,000 and 102,000 metric tons of anthracite and bituminous coal, respectively, on hand as of September 30, 1988 (see app. III). Based on approved heating plant conversions and DOD's reported coal inventory levels, these on-hand inventory totals will be sufficient to satisfy demands for anthracite coal through at least fiscal year 1993 (see fig. I.5). If planned conversions are added, the on-hand inventory will satisfy projected demands through fiscal year 1994 (see fig. I.6). In the case of bituminous coal, less than a 1-year supply is available. These estimates are based on the assumption that no additional shipments of coal will be made. Furthermore, these estimates could change, given the potential coal inventory data inaccuracies that could affect about 40 percent of the total inventory, the implementation of 27 conversions certified by the Secretary of Defense, and the uncertainty in actual conversion dates.

Detailed inventory and consumption data supporting figures I.5 and I.6 are contained in appendixes III, V, and VI.

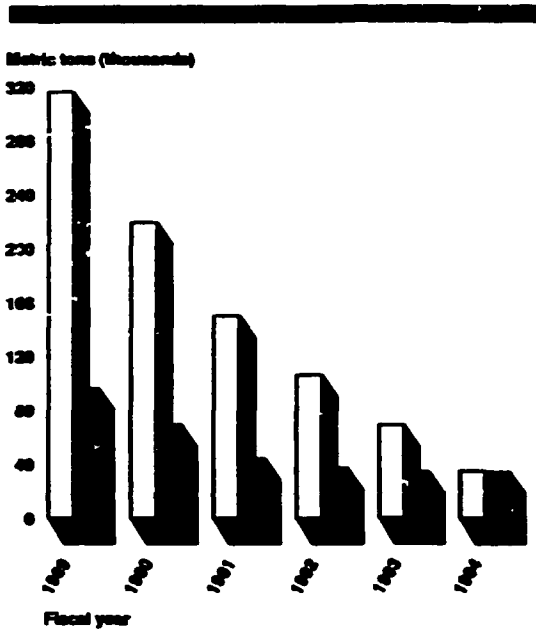
ure 1.5: Future Anthracite Coal entories Compared to Consumption sed on Approved Conversions



DOD stated that, as of September 30, 1988, DOD facilities in Germany had a minimum of a 5-year supply of anthracite coal on hand. It said that these stocks will probably last longer, since only nut-sized anthracite will be consumed by fiscal year 1993, at the earliest. Other sizes of anthracite will last at least until fiscal year 1998, at projected levels of use.[a]

[a]The projected levels of use are based on the assumption that the 27 heating plant conversions certified by the Secretary of Defense to be in the national interest would be completed between fiscal years 1992 and 1993.

re I.6: Future Anthracite Coal ntories Compared to Consumption pproved and Planned Conversions



ɔendix II

OD-Reported Coal Inventory by Location

ɜtion	April 1, 1988 Amount (metric tons)	Percent	September 30, 1988 Amount (metric tons)	Percent	December 31, 1988 Amount (metric tons)	Percent
nau central storage facility	170,200	56	249,529	59	262,828	63
/ communities	107,889	35	132,056	32	118,069	28
orce bases	28,244	9	35,649	9	37,817	9
P	306,333	100	417,234	100	418,714	100

[a]Percentages may not add due to rounding.

ɔendix III

OD-Reported Coal Inventory by Type and Size

ıtion	April 1, 1988 Amount (metric tons)	Percent	September 30, 1988 Amount (metric tons)	Percent	December 31, 1988 Amount (metric tons)	Percent
racite[a]						
ɔ	69,750	23	158,431	38	149,457	36
	82,701	27	92,412	22	84,432	20
	40,041	13	64,746	16	57,458	14
al	192,492	63	315,589	76	291,347	70
ninous						
	105,739	35	93,340	22	118,221	28
um	8,102	3	8,305	2	9,146	2
al	113,841	38	101,645	24	127,367	30
P	306,333	100	417,234	100	418,714	100

[a]Coal is mined in a variety of sizes.

[b]Percentages may not add due to rounding.

ppendix IV

Coal Consumption for Fiscal Years 1983-1988

Metric tons

Fiscal year	Type		
	Anthracite	Bituminous	Total
1983	313,941	191,466	505,407
1984	272,360	205,986	478,346
1985	238,168	203,042	441,210
1986	202,122	210,143	412,265
1987	166,748	190,175	356,923
1988	120,633	141,668	262,301

Fiscal year	Consumer		
	Army	Air Force	Total
1983	405,919	99,488	505,407
1984	388,322	90,024	478,346
1985	354,771	86,439	441,210
1986	325,979	86,286	412,265
1987	286,784	70,139	356,923
1988	194,223	68,078	262,301

ndix V

al Consumption Based on Approved nversions for Fiscal Years 1989-1992

Metric tons

	Type		
Fiscal year	Anthracite	Bituminous	Total
1989	96,487	123,564	220,051
1990	69,628	96,907	166,535
1991	51,105	59,950	111,055
1992	49,275	58,150	107,425

	Consumer		
Fiscal year	Army	Air Force	Total
1989	149,201	70,850	220,051
1990	95,685	70,850	166,535
1991	40,205	70,850	111,055
1992	36,575	70,850	107,425

ɛndi:: VI

oal Consumption Based on Approved and lanned Conversions for Fiscal Years 1989-)92

Metric tons

Fiscal year	Type: Anthracite	Type: Bituminous	Total
1989	96,487	123,564	220,051
1990	69,438	92,407	161,845
1991	44,136	52,630	96,766
1992	36,922	50,230	87,152

Fiscal year	Consumer: Army	Consumer: Air Force	Total
1989	149,201	70,850	220,051
1990	90,995	70,850	161,845
1991	25,916	70,850	96,766
1992	16,302	70,850	87,152

ndix VII

ojectives, Scope, and Methodology

During the past year, some members of the Congress expressed concern about the accuracy of coal inventory and consumption data reported by DOD for its facilities in Europe. They said that the data were constantly changing and, therefore, probably erroneous. As a result, the Ranking Minority Member, Subcommittee on General Services, Federalism, and the District of Columbia, Senate Committee on Governmental Affairs, asked us to verify DOD's data. The specific objectives of our review were to verify the accuracy of DOD-reported coal inventories as of April 1, 1988, September 30, 1988, and December 31, 1988. We were also asked to review past, current, and projected coal consumption at DOD facilities in Europe.

We visited the Defense Energy Programs Office, Washington, D.C., and the headquarters of the U.S. Army and Air Force, Europe, to obtain data on the type and amount of coal on hand and consumed at 44 U.S. Army and 6 Air Force locations in Germany. We selected six locations for detailed review.

As requested, we reviewed Rheinau because it stored about 60 percent of DOD's coal in Germany as of September 30, 1988. We chose the Army communities at Nuernberg, Schweinfurt, and Hanau because, as of the end of fiscal year 1988, they had the largest reported Army coal inventories in Germany and accounted for 39 percent of Army coal. Similarly, we selected Bitburg and Spangdahlem Air Force Bases because, as of the end of fiscal year 1988, they accounted for 66 percent of the reported coal stored by all Air Force bases in Germany. As agreed with your office, we limited our detailed work on actual consumption data at these locations to fiscal year 1988 for two reasons. First, we could not verify DOD's reported coal consumption data for fiscal year 1982 because the Air Force supporting data for that time period had not been retained and, therefore, the overall data were incomplete. Second, we did not try to verify fiscal year 1983 through 1987 consumption data because it would have involved a time-consuming and labor-intensive review of thousands of coal-fired boiler usage records. However, we did review consumption trends for earlier years as a basis for reviewing DOD's projected levels of coal usage for fiscal years 1989 through 1992.

To verify DOD's coal inventory data, we reviewed the physical inventory process and/or the coal inventory records at the six coal-handling locations we visited. At three of these locations—Rheinau and the two Air Force bases—we observed coal yard personnel conducting physical inventories. We also obtained the results of a special inventory the

Army performed at Rheinau using a photogrammetrical survey,[1] and we compared these results to the Army's manual inventory method. We reviewed past physical inventory documents at the three Army communities.

At each of the six locations, we also reviewed applicable inventory records for April through December 1988. Our review of inventory records included monthly coal activity reports, stock record cards, and receipt and issue documents. Finally, we attempted to reconcile the official inventory records (stock record cards) with physical inventory results and DOD-reported inventory data.

To verify past coal consumption data, we traced the data reported by DOD back to summary or consolidated reports at the Rheinau central coal facility and at the Army's V and VII Corps headquarters and, in turn, to specific source documents for various coal-burning military facilities in Germany.

We also reviewed the Army's and Air Force's projected coal consumption data for fiscal years 1989 through 1992. To assess the reasonableness of these projections, we obtained information on the number of contracts signed or planned for converting heating plants from coal to other energy sources. Furthermore, at the Army's V and VII Corps headquarters, we reviewed all heating conversion contracts to verify that the contract completion dates matched the dates used in developing the projections. We reviewed individual heating facility consumption records and heating conversion plans for three Army communities and discussed heating conversion progress with engineering officials.

We also compared reported DOD coal inventory data with projected coal consumption rates to determine how long existing inventories could last. Our comparison was based on the on-hand coal inventory as of September 30, 1988, and the approved and planned heating plant conversions and an assumption that no additional coal shipments would be made.

We conducted our review from January to September 1989 in accordance with generally accepted government auditing standards.

[1] A photogrammetrical survey uses aerial photography to measure coal piles and computers to calculate volumes. Large American coal consumers, such as the Tennessee Valley Authority, use this survey because of its reported accuracy.

Comments From the Department of Defense

Note GAO comments supplementing those in the report text appear at the end of this appendix

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON D C 20301-8000

PRODUCTION AND LOGISTICS

December 22, 1989

(L/EP)

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "MILITARY LOGISTICS: Coal Inventory and Consumption in the Federal Republic of Germany," dated October 31, 1989 (GAO Code 391627), OSD Case 8168. The DoD generally concurs with the report, but offers the following clarifications.

The DoD emphasizes that, as of September 1988, DoD facilities in Europe had a minimum of five years' supply of anthracite on hand. These stocks will probably last longer, since only nut size anthracite will be consumed by Fiscal Year (FY) 1993, at the earliest. Other sizes of anthracite will last at least until FY 1998, at projected levels of use.

See comment 1

The GAO reported that records could not be verified at specific locations without a new inventory. While technically correct, the report implies that existing data are unreliable. The DoD points out, however, that: in all cases where time and resources were available to perform new inventories, the data previously reported were verified or found to be conservative. A more fair picture would be presented if the report showed both the previously estimated and actual inventory data, where available.

The GAO also reported that the Army did not comply with internal control procedures requiring annual physical inventories with properly shaped coal piles at Rheinau. While not directly responsible for coal inventory, the U.S. Army Europe conducted a special inventory of the coal yard in May 1989. This inventory consisted of a "fly over" technique recommended by the GAO for its

See comment 2

accuracy. The results verified the Rheinau inventory to be within 1.6 percent of earlier estimates.

In addition, the GAO noted internal control inventory problems at three other Army locations and discussed problems identified by the Army Auditor General in 1982. The Army concurred with all of the findings and recommendations concerning coal receipt, handling and inventories reported in the earlier audit and instituted corrective actions to improve its coal accounting procedures. Indications are that the Army coal accounting procedures are now thorough and reflect accurate inventories at all locations. This accuracy has been maintained even though, as the result of congressionally directed procurement, the supply of anthracite coal in Germany is now five to ten times the Army requirement.

At several Air Force locations the GAO identified coal excesses so large that they prevented the proper shaping of coal piles necessary for inventory verification. It should be recognized that these excesses resulted from purchases directed by the Congress. To address the inventory accuracy issue, during the first quarter of FY 1990 the Air Force will develop an alternative inventory assessment technique. The Air Force will also consider including coal inventory as a material weakness in the next Air Force Assurance Statement.

Overall, the GAO report presents an accurate discussion regarding congressional restrictions on conversion, environmental concerns of German communities, and an accurate baseline on coal inventories. The DoD appreciates the opportunity to comment on the draft report.

Sincerely,

Jack Katzen
Assistant Secretary of Defense
(Production and Logistics)

The following are GAO's additional comments on DOD's letter dated December 22, 1989.

AO Comments

1. We do not believe that a comparison of previous actual and estimated inventory data by location is relevant to the accuracy of the data for the current inventory. Moreover, the report points out that we could only verify actual current inventory data at two of the six locations reviewed.

2. After we received DOD's written comments, DOD advised us that the 1.6 percent difference between earlier estimates and the aerial survey should be 1.4 percent.

Appendix IX

Major Contributors to This Report

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European Office	Harry Tyner, Evaluator-In-Charge Christina Warren, Evaluator